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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,503	03/07/2002	Eiji Okamoto	220484US2	8763

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EXAMINER	
PANWALKAR, VINEETA S	
ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,503	OKAMOTO, EIJI	
	Examiner	Art Unit	
	Vineeta S. Panwalkar	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-8,10,12 and 13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5-8 and 10* is/are allowed.

6)☒ Claim(s) *12 and 13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment After Final

1. The finality of the office action mailed 02/07/06 is withdrawn in view of new ground(s) of rejection. Claims 12 and 13 were previously indicated to have allowable subject matter. However, a new search has revealed prior art disclosing these limitations. Thus, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaewell, Jr. (US 6256339 B1, previously cited), hereinafter Kaewell, in view of Balachandran et al. (US 6108374), hereinafter, Balachandran.

2a. Regarding claim 12, Kaewell discloses a multi-channel Viterbi decoder wherein is disclosed a multi-mode block-coded modulation/demodulation method for a transmission system equipped with a multi-mode encoder and a multi-mode

decoder (Fig.2, transmitter 19 and receiver 21 perform the claimed modulation/demodulation method) comprising the steps of:

- determining a transmission mode based on transmission data contents, an amount of data and a required transmission quality (Column 3, lines 39-53. the selection of one of various data rates is interpreted as the claimed determining; the selection is made based on whether it is voice or non voice data (claimed data contents), the amount of voice activity (claimed amount of data); see column 2, lines 18-19 and column 5, lines 38-40. The SNR is kept as great as possible by varying data rates and thus a certain gain and noise figure are received for each symbol sent. This is interpreted as the claimed mode determination based on required transmission quality);
- making changes to a number of code levels, the multi-mode encoder, a modulation system and a signal point assignment method based on the mode (The code levels and thus the modulation and signal point assignment inherently change as per selected data rate. See column 4, lines 43-50; since redundancy is introduced by sending the symbols at 64kbps, effectively, for rates lower than 64kbps, symbols with fewer code levels are sent);
- encoding the data to obtain a signal; sending the signal; receiving the signal; (Transmitter 19 sends the encoded signal and it is received by receiver 21; see column 3, line 53 – column 4, line 50).
- determining a number of trellis states and decoding the received signal using maximum-likelihood decoding (column 4, lines 20-31. The multi-rate Viterbi

decoder 61 is interpreted as the element performing the claimed maximum-likelihood decoding).

Kaewell further shows that the multichannel, multi-rate Viterbi decoder can be used in multichannel wireless communication stations with the reception of communication signals and the system may reside in either a base station or a mobile user receiver (claimed mobile station in a wireless communication system).

Thus, Kaewell discloses all the limitations claimed, but fails to explicitly disclose how the movement of the mobile station affects transmission modes.

In the same field of endeavor, however, Balachandran discloses system and method for measuring channel quality wherein:

- for transmission from a mobile station in a wireless communications system, transmission modes are switched in accordance with movement status which represents that the mobile station is moving or at rest (Column 1, lines 18-60. Balachandran acknowledges that mobile stations can adaptively change data rates (claimed switching of transmission modes) based on varying signal strength (fading) caused as a result of the movement of the mobile station. In column 9, lines 1-10, Balachandran shows that the FER (frame error rate) varies with different mobile speeds (The mobile speed indicated whether the mobile station is at rest or moving). Balachandran shows an adaptive rate mobile transmitter that uses the FER to adapt the rate of transmission

accordingly (Column 3, lines 25-57). This is interpreted as the claimed switching of transmission mode).

Thus, it would have been obvious to a person of ordinary skill in the art to switch the transmission mode based on different mobile speeds as suggested by Balachandran because the adaptive data rate method increases data throughput over the fading channels encountered in cellular systems, taking into consideration the channel quality based on FER (i.e. by dynamically adapting to channel conditions) (Column 1, lines 18- 38).

2a. Regarding claim 13, Kaewell discloses a multi-channel Viterbi decoder wherein is disclosed a multi-mode block-coded modulation/demodulation method for a transmission system equipped with a multi-mode encoder and a multi-mode decoder (Fig.2, transmitter 19 and receiver 21 perform the claimed modulation/demodulation method) comprising the steps of:

- determining a transmission mode based on transmission data contents, an amount of data and a required transmission quality (Column 3, lines 39-53. the selection of one of various data rates is interpreted as the claimed determining; the selection is made based on whether it is voice or non voice data (claimed data contents), the amount of voice activity (claimed amount of data); see column 2, lines 18-19 and column 5, lines 38-40. The SNR is kept as great as possible by varying data rates and thus a certain gain and noise

figure are received for each symbol sent. This is interpreted as the claimed mode determination based on required transmission quality);

- making changes to a number of code levels, the multi-mode encoder, a modulation system and a signal point assignment method based on the mode (The code levels and thus the modulation and signal point assignment inherently change as per selected data rate. See column 4, lines 43-50; since redundancy is introduced by sending the symbols at 64kbps, effectively, for rates lower than 64kbps, symbols with fewer code levels are sent);
- encoding the data to obtain a signal; sending the signal; receiving the signal; (Transmitter 19 sends the encoded signal and it is received by receiver 21; see column 3, line 53 – column 4, line 50).
- determining a number of trellis states and decoding the received signal using maximum-likelihood decoding (column 4, lines 20-31. The multi-rate Viterbi decoder 61 is interpreted as the element performing the claimed maximum-likelihood decoding).

Kaewell further shows that the multichannel, multi-rate Viterbi decoder can be used in multichannel wireless communication stations with the reception of communication signals and the system may reside in either a base station or a mobile user receiver (claimed mobile station in a wireless communication system).

Thus, Kaewell discloses all the limitations claimed, but fails to explicitly disclose how the movement of the mobile station affects transmission modes.

In the same field of endeavor, however, Balachandran discloses system and method for measuring channel quality wherein:

- when a transmission is from a mobile station of a mobile wireless communications system, switching transmission modes according to a noise environment of the mobile station. (Fig. 11, column 10, lines 12- 56. The adaptive rate change wherein the adaptive channel encoder and modulator 166 which switches to the new encoding and modulation scheme (claimed switching of transmission modes) for the transmit data stream 162 and transmits the information over the channel 170 based on the SINR (Signal-Interference Plus Noise Ratio) estimate 184 (claimed noise environment)).

Thus, it would have been obvious to a person of ordinary skill in the art to switch the transmission mode based on noise environment as suggested by Balachandran because the adaptive data rate method increases data throughput over the fading channels encountered in cellular systems, taking into consideration the channel quality based on SINR (i.e. by dynamically adapting to channel conditions) (Column 1, lines 18- 38).

Allowable Subject Matter

3. Claims 5-8 and 10 are allowed.

The following is an examiner's statement of reasons for allowance:

3a. Regarding claim 5, prior art of record fails to disclose a multi-mode block coded modulation/demodulation for a transmission system equipped with a multi-mode encoder and a multi-mode decoder comprising the step of inserting information on a transmission mode in a multi-mode digital signal using one or more codes of levels as an encoded mode index or indices; and changing codes of other levels according to the transmission mode, in combination with every other claim of the limitation. The claim is interpreted in light of the specification, especially paragraphs [0042] – [0050].

3b. Claims 6, 8 and 10 are allowed as being dependent on claim 5.

3c. Regarding claim 7, prior art of record fails to disclose a multi-mode block coded modulation/demodulation for a transmission system equipped with a multi-mode encoder and a multi-mode decoder comprising the step of assigning different bit series to each of identical signal points for different modulation in a signal space diagram to compose a multi-mode system, in combination with every other limitation of the claim. The claim is interpreted in light of the specification, especially Fig. 9 and paragraph [0052].

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Lee, " The Advantage of using Repetition code in Mobile Radio Communications", 36th IEEE Vehicular Technology Conference, 1986; Volume 36, 20-22 May 1986 Page(s):157. – 161, shows the relationship between speed of mobile units and fading.
- Hortensisus et al. (US 6252854 B1) show adaptive rate selection wireless communication system taking the effects of fading into account.
- Jacobsmeyer (US 5541955) shows adaptive rate selection wireless communication system taking the effects of fading into account.
- Murata (US 6181952 B1) shows a mobile communications system and unit with mode switching based on movement of the mobile unit.
- Bottomley (US 6154507) shows a system and method for signal demodulation with mode switching based on SNR and signal conditions.
- Ritter (US 5724380) shows radio transmission where rate of change of transmission channels increases with increasing speed of subscribers.
- Ue et al. US (6366763 B1) show radio communication wherein the transmission rate is controlled based on signal strength and SIR.
- Uchida et al. (US 6745049 B1) shows mobile communication system that changes transmission rate of communication data transmitted on the basis of a request from the mobile station.

Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vineeta S. Panwalkar whose telephone number is 571-272-8561. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VP.